

Hall Ticket Number :

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R-15

Code: 5P2B35

M.C.A. III Semester Regular Examinations Nov/Dec 2017

Design & Analysis of Algorithms

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. What is an algorithm? Discuss various steps involved in designing and analysing an algorithm 12M

OR

2. Explain the substitution method and recursion tree method of solving a recurrence equation 12M

UNIT-II

3. Discuss Divide and Conquer approach. Explain this approach with Merge sort. 12M

OR

4. Explain how Divide and Conquer approach is followed in Binary search and Binary tree traversals. 12M

UNIT-III

5. Explain general method of Dynamic programming. Explain minimum spanning of multistage graph using Dynamic programming. 12M

OR

6. Explain general principle of Greedy technique. Explain Prim's and Kruskal algorithm for finding minimum spanning tree. 12M

UNIT-IV

7. Explain the general approach of Back Tracking. How a 8 – Queen problem can be solved using this approach. 12M

OR

8. Explain the general approach of Branch and Bound. Explain how N people can assigned to N jobs so that the total cost of assignment is as minimum as possible. 12M

UNIT-V

9. a) Explain how connected components of a graph can be identified. 6M
b) Explain how bi-connected components a graph can be identified. 6M

OR

10. Hamiltonians cycle NP – Complete. Discuss. 12M

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R-15

Code: 5P2B31

M.C.A. III Semester Regular Examinations Nov/Dec 2017

Database Management Systems

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

- 1. a) Explain the advantages of DBMS over file processing system 6M
- b) Discuss specialization, generalization and aggregation 6M

OR

- 2. a) Who are the various users of a DBMS? Write the different purposes of their interaction with DBMS? 6M
- b) Discuss E-R model 6M

UNIT-II

- 3. a) Explain the terms: attribute, tuple, instance of a relation, schema of a relation 6M
- b) Explain six basic operations that can be performed on relations 6M

OR

- 4. Write the structure or syntax of a domain relational calculus and explain it with an example 12M

UNIT-III

- 5. Discuss join, natural join, equi-join, left-outer join and right-outer join 12M

OR

- 6. Explain multi-valued dependencies and 4th normal form with suitable examples 12M

UNIT-IV

- 7. What is a transaction? Explain the various states of a transaction? 12M

OR

- 8. Discuss pitfalls of lock-based protocols 12M

UNIT-V

- 9. Discuss RAID level 0 to RAID level 6 12M

OR

- 10. Discuss extendible hashing. 12M

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R-15

Code: 5P2B34

M.C.A. III Semester Regular Examinations Nov/Dec 2017

Java Programming

Max. Marks: 60

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) Give the structure of a JAVA program and explain in detail. 6M
- b) Explain parameter passing methods with example program. 6M

OR

2. a) What is a Class? How it is Created in java? Explain the importance of Object in Java Programming? 6M
- b) When do we use 'this' keyword? Explain in detail. 6M

UNIT-II

3. a) What are different types of inheritance? Write simple example code for each. 6M
- b) Discuss the concept of method overloading and method overriding. 6M

OR

4. Write short notes on the following:
 - a) anonymous inner classes
 - b) static inner classes12M

UNIT-III

5. a) Make a comparison between the Interfaces and Abstract classes. 6M
- b) Define package. Explain how to create a package with an example. 6M

OR

6. a) What is an interface? Can interface be implemented or extended? Justify your answer with an example? 6M
- b) Create two interfaces and use it in a main class. 6M

UNIT-IV

7. a) Write a program divide by zero to handle exception without using exception handling keywords. 6M
- b) Draw a neat diagram of exception hierarchy and explain in detail. 6M

OR

8. a) Are keywords for exception handling necessary to programmer or not. Justify? 6M
- b) What are the benefits of multi-threaded programming? Write a program for multi-threading. 6M

UNIT-V

9. a) Explain how java is useful in programming network applications. 6M
- b) List and explain various random access file operations. 6M

OR

10. Explain the following:
 - a) Byte Streams
 - b) Character Streams
 - c) Java .net package12M

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Code: 5P2B36

M.C.A. III Semester Regular Examinations Nov/Dec 2017

Operating Systems

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) What is distributed OS? Discuss about distinguishes between Client-Server and Peer-peer models of distributed systems. 6M
- b) With a neat sketch, describe the services of that an operating system provides to its resources and users. 6M

OR

2. a) Discuss about various security issues that arise in multiprogramming and time shared systems? 6M
- b) Explain about overview of system calls. 6M

UNIT-II

3. a) Define Thread? Explain about multithreading model. 6M
- b) What is Process? Explain about different fields of Process Control Block. 6M

OR

4. a) Define Scheduler? Discuss about different types of schedulers with the help of examples. 6M
- b) What is synchronization? Explain how semaphores can be used to deal with n-process critical section problem. 6M

UNIT-III

5. a) Discuss about Deadlock conditions and Bankers Algorithm in detail. 8M
- b) What is safe state? Explain about importance of resource allocation graph. 4M

OR

6. a) Discuss about various methods for prevention of deadlock. 6M
- b) Discuss about i) Mutual Exclusion ii) Circular Wait 6M

UNIT-IV

7. a) What is Virtual Memory? Explain about the issues and benefits of Virtual Memory. 6M
- b) Consider the reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 for a memory with three frames. Trace FIFO, optimal and LRU page replacement algorithm. 6M

OR

8. a) Discuss in detail about various page table structures. 6M
- b) What is page Fault? Explain page fault occurring situations with an example. 6M

UNIT-V

9. a) What is protection? Explain principles of Protection? 6M
- b) Discuss about different kinds of Network Threats may happen in the environment. 6M

OR

10. a) Briefly explain about authentication. 6M
- b) Explain about goals and importance of Protection. 6M

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Code: 5P2B33

M.C.A. III Semester Regular Examinations Nov/Dec 2017

Network Programming

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) With neat sketch explain in detail about UNIX file system. 8M
b) Describe the locating commands. 4M

OR

2. a) Explain in detail about grep family with examples? 8M
b) Illustrate various time commands with examples. 4M

UNIT-II

3. a) Explain about Security File Permissions. 6M
b) Illustrate the relationship between system calls and library functions. 6M

OR

4. a) Explain the Shell responsibilities. 6M
b) Write a Shell program to print prime numbers up to a given number. 6M

UNIT-III

5. a) Explain in detail about kernel support for process, process control, process termination and process API's. 8M
b) When race conditions occurs? How the UNIX OS handles the race conditions? Explain with example program. 4M

OR

6. a) Distinguish fork() and vfork() functions. 4M
b) Write about terminal logins and network logins. 8M

UNIT-IV

7. a) Explain the following functions with example 12M
(i) Kill (ii) Raise (iii) Abort (iv) sleep

OR

8. a) Write briefly about Signal APIs? 6M
b) Explain in detail about Zombie Process, Orphan Process with example 6M

UNIT-V

9. a) Discuss about Socket addresses. 6M
b) Write a simple client/server program for Sockets. 6M

OR

10. a) What are the different IPC techniques? Explain. 8M
b) Write about Unix System Vs API's for Messages. 4M

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R-15

Code: 5P2B32

MCA III Semester Regular & Supplementary Examinations Nov/Dec 2017

Computer Communications

Max. Marks: 60

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) List the uses of computer networks and explain any two uses in detail. 5M
- b) Describe the TCP/IP reference model with a neat diagram 7M

OR

2. a) Differentiate between connection oriented and connectionless services. 6M
- b) Explain the main categories of Wireless Networks. 6M

UNIT-II

3. a) Give the transmission Frame for the data frame 1101011011 using 10011. 6M
- b) Explain sliding window protocol. 6M

OR

4. a) Explain the pure ALOHA protocols. 6M
- b) Illustrate Manchester encoding with examples. 6M

UNIT-III

5. a) Differentiate between virtual circuit and datagram subnets. 6M
- b) Describe Link state routing algorithm. 6M

OR

6. a) Explain the IP protocol in detail. 8M
- b) Write short note on NAT. 4M

UNIT-IV

7. a) Explain the three way hand shaking in TCP connection establishment. 6M
- b) Explain UDP protocol with UDP datagram structure. 6M

OR

8. a) List and explain the important difference between wired and wireless link 6M
- b) Write short note on 802.11 architecture. 6M

UNIT-V

9. a) Write short notes on Digital Signatures. 6M
- b) Describe Leaky Bucket Algorithm. 6M

OR

10. a) Write short notes on Pretty Good Privacy (PGP) 6M
- b) Describe RSA algorithm in brief. 6M
